

Remarks

Claims 18 through 29 are currently pending in the present application. Claims 1 through 17 were withdrawn from further consideration as being drawn to a non-elected invention. Claim 18 has been amended. No new matter has been added.

Rejections under 35 U.S.C. § 112

Claim 18 has been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention, as the Examiner has pointed to instances where the claim omits essential elements. Specifically, the Examiner indicated that the omitted elements are:

- means for introducing fuel from the anode flowpath to the cathode flowpath which contains the recycled fluid;
- means for reacting the fuel with oxygen;
- means for halting the flow of fuel to the cathode when a predetermined condition is met that is commensurate with a substantial consumption of said oxygen in said recirculating loop or how to determine when a substantial consumption of the oxygen has occurred;
- means present for halting the flow of fuel in the passage connecting the anode flowpath with the cathode flowpath;
- structure that would allow for determining when a substantial consumption of the oxygen has occurred or what a substantial consumption of the oxygen is; and
- how fuel being provided to the cathode flowpath, which contains the recycled fluid, can react with the oxygen in the recycled fluid when there is no means recited in the claim that would promote said reaction.

By this response, independent claim 18 has been amended to positively recite:

- means for selectively introducing fuel into the recirculation loop of the cathode flowpath (shown in exemplary fashion in each of FIGS. 2A through 2C as a fuel inerting valve **344** and accompanying conduit, and described at pages 11 and 13

through 15 of the original specification);

- means for selectively reacting fuel with oxygen in the recirculation loop (shown in exemplary fashion in each of FIGs. 2A and 2C as a combustor **370**, and described at pages 11 through 14 of the original specification);
- means for halting the flow of fuel to the cathode when a predetermined condition is met that is commensurate with a substantial consumption of said oxygen in said recirculating loop or how to determine when a substantial consumption of the oxygen has occurred (this feature being inherently achieved when either of the aforementioned means are selectively disabled, closed or otherwise shut down based on (by way of example) voltage or oxygen sensor **380** readings);
- means present for halting the flow of fuel in the passage connecting the anode flowpath with the cathode flowpath (satisfied by the recitation above for selectively introducing fuel into the cathode flowpath, or in the alternate, by purge valve **346** and associated conduit, as shown in FIGS. 2A through 2C); and
- how fuel being provided to the cathode flowpath, which contains the recycled fluid, can react with the oxygen in the recycled fluid when there is no means recited in the claim that would promote said reaction (this feature being inherently achieved through the combustor **370** or related means for selectively reacting fuel with oxygen in the recirculation loop).

Regarding the Examiner's position that there is no structure recited that would allow for determining when a substantial consumption of the oxygen has occurred or what a substantial consumption of the oxygen is, the Applicant submits that the occurrence of a voltage upon which the supply of reacting fuel is ceased is merely a condition precedent that, once satisfied, allows the remaining components (in particular, one or more of the aforementioned valves or combustor) to disable such continued reaction. As such, there is no need to positively recite such a structure (which may, for example, be the oxygen sensor (with or without an accompanying controller) **380**, as shown in FIGS. 2A through 2C).

By all of the above amendments and explanation, the Applicant submits that there is

adequate connectivity between the recited elements, thereby removing any gaps between such component recitation. As such, the Applicant is of the belief that the present rejection under 35 USC 112, second paragraph has been overcome.

Rejections under 35 U.S.C. §103

Claims 18 through 25 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Cargnelli et al (US 2004/0146761, hereinafter Cargnelli). Claims 28 and 29 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Cargnelli in view of Reiser et al (US 2002/0076583, hereinafter Reiser).

Claim 18 has been amended to more particularly recite the features of the present invention, specifically that the method is for reducing voltage potentials on fuel cell components that arise out of transient operation of a fuel cell system. This is both consistent with the remainder of the claim (where fuel introduced into the recirculation loop of the cathode flowpath is reacted until such time as a measured voltage across a fuel cell reaches a predetermined value) and the original specification (see, for example, the first full paragraph on page 12 and the first paragraph on page 16), where reduction in fuel cell voltage as a result of inerting the cathode reduces the likelihood of damage to the catalyst supports at the anode and cathode. These benefits are also discussed starting in the last paragraph of page 17 and accompanying FIG. 4.

Cargnelli stands in stark contrast to amended claim 18. Specifically, Cargnelli is entirely silent as to how to reduce the likelihood of achieving voltage reductions at the cells during start-up, shut-down or other transient operation of a fuel cell system. The mere presence of recirculation loops that are ostensibly included in Cargnelli are insufficient in and of themselves to ensure that proper reactant purging (and concomitant fuel cell voltage reduction) is effected during such transient operating periods. That Cargnelli fails to address the needs of understanding such cell voltage levels as an indicator of proper electrode purging is compelling evidence of its inappropriateness as a basis for the present rejection, as a bedrock principle for establishing a prima facie case of obviousness under MPEP 2143.03 is that all of the claim limitations must be taught or suggested. As such, the Applicant respectfully submits that in light

of the present amendments to claim 18, Cargnelli can no longer be relied upon as a basis for rejection of that claim or claims 19 through 25 that depend therefrom.

With regard to dependent claims 28 and 29, Reiser does not correct the deficiencies of Cargnelli, as there is nothing in Reiser that suggests configuring a cathode flowpath to include a recirculation loop where excess reactants can be purged. Instead, Reiser teaches the use of an anode recycle loop, which was discussed in the first full paragraph of page 2 of the original specification as being disadvantageous in that "complex system componentry, including additional pumps coupled to intricate valve networks all tied together with precision control mechanisms, is required." The unequivocal disavowal of the anode recycle loop of Reiser by the Applicant is yet an additional example of MPEP 2143.03 not being satisfied, as nothing in that combination of teachings covers all of the claimed features. Thus, in addition to the reasons discussed above in conjunction with claim 18, the Applicant respectfully submits that the present rejection of claims 28 and 29 can no longer be maintained.

The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,

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